

REQUEST FOR RECONSIDERATION

Claims 1-11, 13 and 15-20 will now be active in this application.

The claimed invention is directed to a process for preparing a readily water-redispersable polymer powder and polymer powder prepared by said method.

Applicants wish to thank examiner Godenschwager for the helpful and courteous discussion held with their U.S. representative on February 2, 2010. At that time, applicants' U.S. representative argued that spray drying of an aqueous polymer dispersion with a spray assistant was not rendered obvious from a process from tanning animal hides as the ability to spray dry and reconstitute the tanning agent *per se* was not suggestive of properties as a spray drying assistant. The following is intended to expand upon the discussion with the examiners.

Aqueous dispersions of polymer particles have many commercial uses. In view of the high water content, transport of such aqueous polymer dispersions can suffer an economic detriment in terms of transportation costs. Efforts to prepare spray dried polymer powders, which can be transported more cost effectively, have experienced some difficulties with redispersion and discoloration such that processes for the preparation of polymer powders which are readily water-dispersible are still sought.

The claimed invention addresses the problem by providing a process for preparing a readily water-dispersible polymer powder **by spray drying an aqueous polymer dispersion** in the presence of a spray assistant A which is **the reaction product** of a dihydroxydiphenyl sulfone, an aliphatic aldehyde and sodium sulfide. Applicants have discovered that such a reaction product is an effective spray assistant for providing a readily water-redispersible polymer powder. Such a process is nowhere disclosed or suggested in the cited references of record.

The rejections of claims 1-13, 17 and 20 under 35 U.S.C. § 103(a) over Pabst et al. (WO 03/016578) as evidenced by U.S. 6,881,356, in view of Weitzel et al. (U.S. 6,127,483) and of claims 15-16 and 18-19 under 35 U.S.C. § 103(a) in further view of Sandor et al U.S. 6,469,135 are respectfully traversed.

None of the cited references disclose or suggest a spray drying process of an aqueous polymer dispersion in which the spray assistant is the reaction product of a dihydroxydiphenyl sulfone, an aliphatic aldehyde and sodium sulfide.

Pabst et al. describes a process for preparing a sulfone-containing **tanning material** comprising a component (A) prepared by a) reacting phenol with constituted sulfuric acid, with oleum or a mixture thereof to form a mixture containing phenolsulfonic acid, dihydroxydiphenyl sulfone and sulfuric acid followed by condensation with an aliphatic aldehyde, and a component (B) obtained by reacting a dihydroxydiphenyl sulfone with an aliphatic aldehyde and sodium sulfide. In a tanning process the composition is acted on an animal hide. The composition is not described as suitable for a spray drying assistant but rather only as a tanning agent. Thus, there would have been no motivation to uses such a material in a spray drying method.

Page 3 of the official action suggests that the demonstrated spray drying and redissolution in water of the tanning material of Pabst et al (column 4, lines 57-67) would have motivated one of ordinary skill in the art to use such a tanning material in a spray drying method.

Applicants respectfully submit that it would not have been obvious to have used the tanning material of Pabst et al. in a spray drying process of an aqueous polymer dispersion as functionality in terms of being spray dried and redissolved provides no suggestion that such an agent would assist in the spray drying and redispersion of a polymer dispersion. Simply

being able to be spray dried and redissolved does not suggest any function as a spray drying assistant. There simply is no meaningful correlation between the two properties.

Weitzel et al. (U.S. 6,127,483) describes a known spray auxiliaries as **naphthalenesulfonic acid-formaldehyde** or **benzenesulfonic acid-formaldehyde** condensation products. As such, those of ordinary skill in the art would not be motivated to use the dihydroxydiphenyl sulfone/aliphatic aldehyde reaction product of Pabst et al. in a spray drying method.

Sandor et al. has been cited for a disclosure of polymer powder sizes. However, this reference fails to cure the deficiencies of the cited references which fail to disclose or suggest using a reaction product of dihydroxyphenyl sulfone, aliphatic aldehyde and sodium sulfite as a spray drying assistant.

Withdrawal of the rejections under 35 U.S.C. § 103(a) is respectfully requested.

Although not relied upon in the outstanding official action, during the discussion with the examiner, the Weiser et al. disclosure was discussed.

Weiser et al. describes a composition which has separate functions as a spray assistant and as a leather tanning agent.

Weiser et al. describes a spraying aid using a condensation polymer of sulfonated phenols, urea, other organic nitrogen-bases and formaldehyde (see Abstract). The condensation polymer is identified as also being well-suited for use in a separate process as a tanning agent (column 4, lines 1-3). There is no disclosure of using a spray assistant obtained by reacting a dihydroxydiphenyl sulfone, an aliphatic aldehyde and sodium sulfide in a spray drying process.

While the office has previously cited to the condensation polymer of Weiser et al. as both a spray assistant and tanning agent (column 1, lines 9-16) as motivation for using the known tanning material of Pabst et al. in a spray drying method, the unique structures of

Weiser et al. which may be used as both a spray drying aid and a tanning agent does not create an expectation that all tanning agents would be expected to behave as spray drying assistants. As previously noted, known spray drying assistants have an aromatic sulfonic acid structure, which is not found in the product of Pabst et al. such that there would be no motivation to use such a reaction product in a spray drying method. For this reason, the claimed invention would not have been obvious.

Not only would it not have been obvious to use the tanning agent of Pabst et al. in a polymer powder spray drying method, but there would have been no expectation of improved whiteness for a polymer powder dispersed with a spray drying assistant as claimed.

The examiner's attention is directed to table 1 appearing on pages 15-16 of applicants' specification. Powders P1 and P2 were prepared using a spray assistant as claimed and is based on the reaction product of dihydroxydiphenyl sulfone, formaldehyde and sodium sulfite. Powders PV1 and PV2 were prepared using spray assistants based on the reaction product of a sulfonated naphthalene **with formaldehyde** (SV2) and the reaction product of a sulfonated phenol **with formaldehyde** (SV3). For the examiner's convenience the data from table 1 is reproduced below.

Powder	Dispersion	Spray assistant	Yield [% by wt.]	Color	Redispersibility	Yellowing of the film
P1	D1	S1	82	white	good	1-2
P2	D2	S1	83	white	good	1-2
PV1	D1	SV2	84	yellow	good	4
PV2	D1	SV3	83	brown	good	5

Powders PV1 and PV2, prepared using spray assistants based on sulfonated naphthalene (SV2) and sulfonated phenol (SV3) respectively, while exhibiting good redispersibility, also exhibited a **pronounced coloration** as well as a **detectable yellowing** for polymer films formed there from.

In contrast, powders P1 and P2, prepared using a spray assistant as claimed based on dihydroxydiphenyl sulfone, exhibited good redispersibility but exhibited **no pronounced coloration** (white) and significantly **less yellowing** for polymer films formed there from. Thus, even if it were obvious to have used the tanning agent of Pabst et al. as a spray drying aide, there would have been no expectation of improved properties from a polymer powder prepared using such a spray assistant. Thus, applicants have discovered an improved result from the combination as claimed.

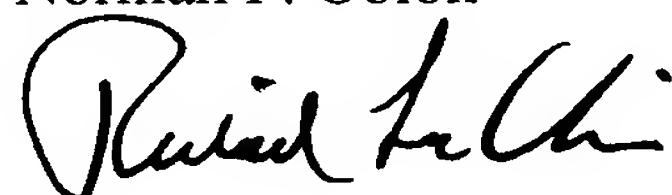
Applicants note the objection to claims 11-13 and 15-20 as not further limiting of the process of claim 1.

Applicants respectfully submit that claims 11 and 15-17 are directed to the product of the process of claim 1, a format which is well accepted by the USPTO (see claims 1 and 7 of U.S. 6,881,356). Claim 13 is directed to a dispersed polymer powder prepared from the redispersible polymer powder of claim 11 which is prepared by the process of claim 1. The suitability of such claims is clear as such is a format which is well accepted by the USPTO (see claim 10 of U.S. 6,881,356). As to claims 18-20, these claims further limit the process in terms of the size of the polymer powder particle size and the content of spray assistant A. Withdrawal of this objection is respectfully requested.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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